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CASE REPORT

Obturators to facilitate speech and swallowing in a maxillectomy patient with dementia and cerebral infarction

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ABSTRACT

The purpose of dental treatments normally includes the recovery from the functional impairments and aesthetic problems. This case report describes the rehabilitation of a maxillectomy patient with dementia and cerebral infarction, using obturators made of different materials to facilitate speech and swallowing. The patient had difficulty inserting the original prosthesis by himself and would sometimes bite down on the obturator to position it in his mouth instead of using his hands. As a result, the obturator caused irritation and bleeding, especially in the sensitive maxillectomy area. Ultimately, a new obturator with a base made of heat-cured acrylic resin and a bulb made of silicone was delivered. In this article, we describe the case and discuss the use of the obturator to recover swallowing and speech function in this patient. (*Int J Maxillofac Prosthetics 2019;1:33-35*)

INTRODUCTION

In Japan, the elderly population over 65 years old is approaching 35 million people and accounts for over 21% of the total population. This super-aging society has altered the situation surrounding Japanese dental care, requiring changes in patient reception, check-up methods, explanations provided to patients and their families for obtaining informed consent, planning treatment, and fabricating and placing prostheses. The super-aging society has also led to an increase in oral tumour cases, a trend that is expected to continue and to result in increased demand for maxillofacial prosthetics.[1] Evidence of this phenomenon has been observed in our clinic for maxillofacial prosthetics, where the populations of elderly patients and those with oral tumours have grown rapidly over the past 35 years.[2] This has changed the role of prosthodontists, requiring their greater involvement in maxillofacial prosthetics.

It is well known that maxilla resection causes oral-nasal communication and results in speech impairments,[3] swallowing disorders,[4] and reduced quality of life. For maxillectomy patients, an obturator is a useful prosthetic treatment option; however, the complicated structure of the defect area as well as its sensitivity and tendency to bleed can hamper the patient's ability to wear the prosthesis. These obstacles may be further compounded by trismus, dementia, or cerebral infarction. Occasionally, patients choose to give up wearing a removable prosthesis, which is a reasonable option in some cases; however, for patients with maxillectomy, going without an obturator prosthesis can mean sacrificing substantial swallowing and speech function. In this article, we describe the case of a maxillectomy patient with dementia and cerebral infarction, and discuss the use of an obturator prosthesis to recover swallowing and speech function according to the patient's priorities and condition.

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This clinical report was approved by the institutional ethics committee of the Tokyo Medical and Dental University, Faculty of Dentistry (approval number: D2016-012) and conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from the patient and his family to publish their case information.

CASE REPORT

A 53-year-old man with squamous cell carcinoma who had undergone maxillectomy in 2000 was referred to our maxillofacial prosthetics clinic in 2001 for fabrication of an obturator prosthesis. After maxillectomy, he experienced disordered swallowing and speech due to leakage of water and air caused by oral-nasal coupling. These conditions were improved after delivery of the obturator prosthesis. His experience of wearing the obturator was uneventful until 2012, when he had a cerebral infarction that left him with hemiparesis and vascular dementia requiring full-time care from his wife. Since then, he could not use his right side hands and fingers.

Following the sudden death of his wife in 2013 due to her cancer, he was placed in a nursing home and his dementia worsened. Sometimes he could not understand where was he now and easily angry with something. He then began having difficulty inserting his prosthesis by himself. Because, he had disability to use his right side fingers caused by hemiparesis and also he lost spatial ability caused by dementia. He sometimes became confused on how to position the obturator or was unable to place it with his hands due to lack of coordination, and instead would bite down on the obturator to position it; this caused irritation, especially to the maxillectomy defect sensitive area (Fig. 1). In 2016 at age 68, the patient came to our clinic with his son. His Hasegawa Dementia Scale Revised Version (HDS-R) score was 20, confirming borderline dementia.[5] He scored 2/4 on the temporal orientation portion of the HDS-R, 0/4 on the inverse of three numbers, and 0/4 on frontal lobe function.

To resolve the patient's problems such as bleeding caused by his uncorrected insertion that he would bite down on the obturator to position instead of using his hands, a prosthetic including an acrylic base plate without artificial teeth was fabricated and provided; however, this was still difficult for him to insert. A second obturator was fabricated using silicone (Fig. 2). The use of silicone resolved the irritation and tendency to cause bleeding but created a new problem with retention. In the next attempt, a plastic plate was used with a silicone bulb (Fig. 3). The patient wore this obturator for 2 months without any major problems, but the biting force he applied each time he tried to insert the prosthesis finally caused the plate to fracture, which led to recurrence of the irritation and bleeding. Ultimately, an obturator with a heat-cured acrylic resin base (Fig. 4) and a silicone bulb was delivered (Fig. 5). Among those fabrications, the stock tray, impression compound cake type and alginate impression material were selected for preliminary impression. As a final impression, individual tray was prepared and the alginate impression material was used on the stage of final impression. Because, the setting time is shorter than the silicone materials and reasonable for this patient. The individual tray for the patient was kept and used repeatedly.

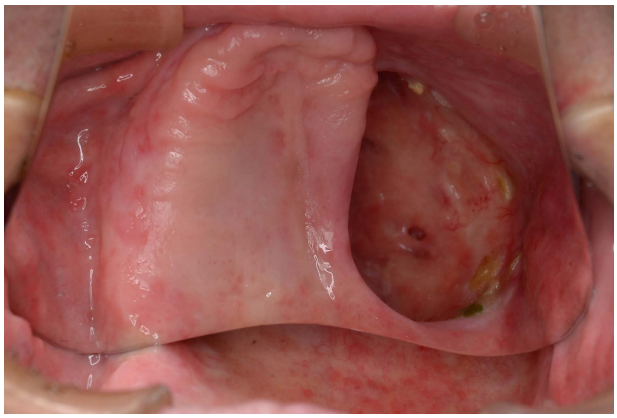

Fig 1. Intraoral photo showing the maxillectomy. Oral-nasal coupling is evident.

Fig 2. Silicone obturator, which functioned well but with poor retention.

According to the patient's priorities and condition treatment plan with obturator was decided and he restarted to speech and swallow, on the other hand it was true that the obturator prosthesis did not improve his aesthetic and masticatory problems. Occasionally, he can use his old obturator that include artificial teeth, but most of the time, the obturator prosthesis allowed the patient to wear by himself and either, family can help to wear. For family, soft material made

obturator without teeth was easy to deliver than the acrylic resin made obturator prosthesis with artificial teeth. They felt familiar with the soft material than the hard material.This treatment had a significant and positive psychosocial impact on him and his family.

Fig 3. Plastic plate with silicone bulb, which was handled well by the patient with good retention but fractured easily with biting force.

Fig 4. Obturator base made from heat-cured acrylic resin.

Fig *5*. Final obturator, the base is made of heat-cured acrylic resin and the bulb made of silicone.

DISCUSSION

It is predicted that the incidence of cerebral infarction cases and tumour cases in Japan will continue to increase with the aging population.[5] In the present case, the patient required a prosthesis that did not include artificial teeth but would protect the maxillectomy defect area and prevent leakage of air and water as well as irritation. Healing of the oral injury and ease of insertion were more important than improved aesthetics and masticatory function. The obturator designed to address these issues enabled consistent use without problems. Despite having cerebrovascular disease and vascular dementia, the patient was in relatively good health and experienced improved quality of life. Now, once a year follow up and once a two-year refabricating the same type of obturator is still continuing. This treatment had a significant and positive psychosocial impact on him and his family.

CONCLUSION

A new obturator with a base made of heat-cured acrylic resin and a bulb made of silicone allowed the patient with dementia and cerebral infarction to wear by himself and occasionally, family can help to wear. This treatment had a significant and positive psychosocial impact on him and his family.

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